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AUTHOR Rasekoala, Elizabeth
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ABSTRACT

This paper reviews four decades of research on race and education in Great Britain and discusses the deficit theories of underachievement that serve as the structure of most of the studies. Focus is placed on black youth of Caribbean origin and how they perform in British schools. Consideration is also given to constructive frameworks from gender and political dimension research; quantitative aspects of the research; a summary of an interview study of parents, students, and teachers; curriculum access; parental involvement; role models and the cultural identity of black youth; career guidance; and multicultural education techniques. Contains 76 references. (DDR)

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The Black Hole in Science Ranks

Elizabeth Rasekoala

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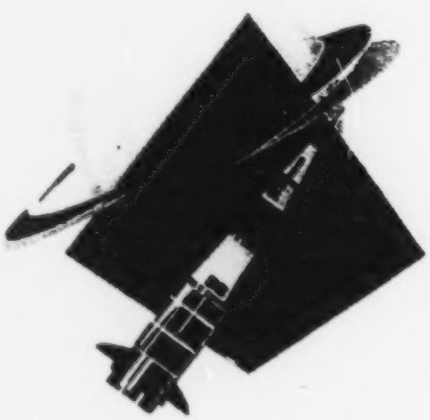
Elizabeth Rasekoala
General Secretary
African-Caribbean Network for
Science & Technology
Ishango House
447 Chester Road
Old Trafford
Manchester M16 9HA
United Kingdom

Tel. no: +44 161 - 877 1480
Fax. no: +44 161 - 877 1481
E-mail: AfricanNetwork@compuserve.com



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The Black Hole in Science Ranks

Four decades of research on 'Race' and Education in Britain : 'Deficit theories of under-achievement'

Black British children of African-Caribbean heritage, as a group, achieve less well academically than all other groups of pupils. This was evident as early as the 1950's, and has continued, in spite of the improved achievements of other ethnic minority groups in Britain. The theories offered in explanation, and the development of ideas by academics and researchers, dating back to the early sixties, have failed to give suitable guidance on causes of 'under-achievement' and strategies to eliminate them. Thus lack of achievement continues to be an educational truism for African-Caribbean pupils.

There have been various theories utilised in research frameworks over the decades, *all*, unfortunately based on 'deficit' models. These have ranged from:

- location of the problem within the Black child and the home environment (lack of intelligence, low self-esteem, and poor behaviour), problematising the Black child/family. See [Goldman & Taylor, 1966; Graham & Meadows, 1967; Coard, 1971; Bagley, 1972; Milner, 1975; Rutter et al, 1974; Rutter et al, 1975; Bagley et al, 1978; Bagley et al, 1979; Driver, 1982; Green, 1985]

- racism in mainstream society and in schools, as a causal factor, particularly, the stereotyping of Black pupils by teachers. See [Black People's Progressive Association, 1978; Rampton, 1981; Taylor, 1981; Tomlinson, 1983; Swann, 1985; Wright, 1985; Mac an Ghail, 1988; Figueroa, 1991; Brook, 1991; Mirza, 1992]

- Other more recent ethnographic research has involved frameworks with 'poor' quality schools as the cause; analysing the effects of teachers and their responses to pupils, and the reactions of pupils of African-Caribbean heritage, to their experiences in the classroom. See [Mortimore, 1988; Smith & Tomlinson, 1989; Tomlinson, 1990; Wright, 1987; Troyna, 1990; Gillborn, 1990; Benskin, 1994]

Constructive Frameworks from Gender & Political Dimension research : Subject-based 'disadvantage'

Throughout this period of research based on the framework of 'deficit' models of under-achievement, there have been very few researchers who have been innovative enough to undertake on 'race' and education, the insightful and progressive research, undertaken by researchers on gender-biased achievement. The most significant breakthroughs in gender research, have been those that focused on the 'disadvantage' of girls, in specific curricular areas, particularly, in Mathematics & Science. See [Spender & Sarah, 1981; Smail, 1984; Spear, 1984; Keller, 1985; Burton,1986; Hollins, 1986; Kelly, 1987; Scott, 1987; Burchell & Millman, 1989; Ramsden, 1990; Brown,1990; Harding, 1991; Clayton, 1992; Dayton, 1992]

The Smith and Tomlinson research was the first to indicate that children of African-Caribbean origin performed less well in Mathematics than white children in the sample schools, although performance in English did not indicate under-achievement (Smith and Tomlinson, 1989). Other researchers have also suggested that mathematics may be a problem in some cases, while performance in English compares well with that of white pupils in the same schools (Sammons, 1995).

During the 1980's, the drive for pedagogical reform, to overcome the disadvantage of girls in Mathematics & Science undertaken by committed, mainly female researchers, together with influences from other researchers in Southern Africa, began to inform an international network of researchers, around the framework defined 'as the Political Dimensions of Mathematics Education' (PDME). The first PDME International Conference was held at the London University Institute of Education, in 1990. The significant contribution of the PDME research network, was a 'radical' perspective, locating the under-achievement in Mathematics, of girls, women, ethnic minorities, and other disadvantaged groups, in the political hegemony of societies, which, in denying these disadvantaged groups, access to the curriculum, and bias in assessment, in this subject area, effectively denied them access to the high level skills which would enable them to access job opportunities, and status/power in mainstream society, thereby perpetuating their disadvantaged positions. See [Fasheh, 1982; Mellin-Olsen, 1987: Gerdes, 1988; Frankenstein, 1989; Walkerdine, 1989; Dowling, 1991; Adler, 1991; Kibi, 1993; Olivier, 1993; Ensor, 1993]

While this perspective might seem radical to some, it is interesting to consider, that while most adults have no qualms about admitting to their limitations in numeracy, easily saying things like "I'm terrible with sums, pass me the calculator", they would feel unbearably ashamed, to admit to being unable to read and write. Why this difference in 'shame' between illiteracy and innumeracy?

Literacy has been constructed to be a basic achievement, while numeracy, has been put on a pedestal, reserved for 'clever' people. It has been accorded an elevated status, and this construct is political, in as much as it is about power and status in society. Mellin-Olsen's (1987) assertion, that Mathematics can be used to enhance the political hegemony of one social group or class, with the exclusion, or a qualified accommodation of another, illustrates this dichotomy well. Costello (1991) supports this framework, explaining the importance of Mathematics in society, *'Competence in Mathematics is looked upon as a ticket to opportunities, careers and lifestyles-it leads to status and power.'*

In Science, while much extensive research has been undertaken into the disadvantage of girls, very little has been done on 'race', but the constructs and framework of this disadvantage are very similar, to those of the political dimensions of mathematics, that is; a national curriculum which is prescriptive, content and process-driven, wholly eurocentric, and denying the global contributions of other cultures to science. *So that 'western' science which is bound up with a particular historical, cultural and geographical context, is elevated to represent the only real truth and valid methodology* (Thorp, 1996). Is this not political? Barry Troyna and Steve Farrow[1] wrote of the processes of science: *The very methodology by which we, as teachers, encourage the learning of science, is also the best vehicle for anti-racist education, and although there may be reasons for turning away from the commitment and responsibility that this brings, there certainly can be no excuses for doing so.*

And still…

Mainstream Mathematics and Science education in Britain today, seems to have largely forgotten education for equality, and ignored global education initiatives, just as it dismissed them as irrelevant earlier in the 1980's. There has also been a profound paucity of research, to describe and explore the extent of this subject-based disadvantage in Mathematics and Science, by Black pupils. In the absence of any mainstream initiatives, either by the education, academic or scientific communities, the African-Caribbean Network for Science & Technology was formed in May 1995, by a group of Black[2] (African & African-Caribbean) professionals, in the various fields of Science, Engineering & Technology (SET), to undertake quantitative and insightful qualitative research, and develop the focused school and community-based strategies, needed to advance the educational achievements and career aspirations of Black youth at all levels in SET, in Britain.

The African-Caribbean Network for Science & Technology, challenges the generalised framework of Black youth educational under-achievement in Britain, and has set out to assert with evidence, the specific nature of Black educational disadvantage, which is particularly located in the curricular areas of Mathematics & Science. This specific and focused disadvantage, can be overcome, with the very same methodologies, strategies and research, implemented to overcome the now, much improved, specific educational disadvantage of girls/women, which has also been similarly located in these curricular areas.

Quantitative Aspects of Research

The generic framework of the educational under-achievement of Black pupils in Britain has been very difficult to challenge, because of the paucity of data on the ethnic monitoring of standard national examination results and tests. This Education policy omission is particularly galling, given the statutory gender monitoring in England & Wales, of all examination results and tests. Why the double standards?
The lack of data was of particular concern, and this became the focus for the initial part of this research. Through collaboration, cajoling, and perseverance, we began to obtain data from some Local Education Authorities (LEA's) and schools, which unfolded a disturbing national trend.

The data obtained from 4 large metropolitan LEA's such as Leeds, Birmingham, Northamptonshire and Berkshire, do give a credible national picture, because of their large populations of African-Caribbean and Asian communities. We approached many other LEA's for data, but most were reluctant to undertake what they saw as 'politically sensitive', and of the few that did, most were wary of going public with their data.

Tables 1 - 5 show the ethnic breakdown of achievement of all pupils, from Baseline Assessment on entry to school (age 4/5), to Key Stage 1 tests (age 7), Key Stage 2 (age 11), key Stage 3 (age 14), and GCSE school leaving examinations (age 16), and enable us to trace the achievement of African-Caribbean pupils, in comparison with mainstream and other ethnic minority groups, as they progress through the education system.

Table 1: Baseline Assessment Results - Birmingham LEA 1994/6

Percentage of Pupils achieving above average

Ethnic Origin	1994 Maths (%)	1994 English (%)	1996 Maths (%)	1996 English (%)
African-Caribbean	**19.4**	**37.6**	**27.0**	**26.0**
Bangladeshi	7.8	19.5	12.5	12.0
Indian	14.3	24.6	20.0	20.0
Pakistani	5.8	13.9	9.5	12.0
White	20.1	34.0	24.0	23.0

Table 2: Key Stage 1 Results - Northamptonshire LEA 1995 & Birmingham LEA 1996

Percentage of Pupils attaining Level 2 (minimum standard) and above

Ethnic Origin	Mathematics (%)		Science (%)		English (%)	
	N/hampton	B/ham	N/hampton	B/ham	N/hampton	B/ham
African	75	-	75	-	75	-
African-Caribbean	**74**	**76**	**81**	-	**84**	**78**
Bangladeshi	43	66	45	-	51	57
Indian	72	82	68	-	68	82
Pakistani	57	64	64	-	57	62
White	80	80	87	-	82	78
Chinese	85	-	92	-	77	-

Tables 1 and 2 show that on entry into the education system, at age 4/5, and early on in school, at age 7, African-Caribbean pupils are on a level commensurate with their peers, from other ethnic groups, in their levels of achievement, across the core[3] subjects of English, Mathematics & Science. This picture at age 4/5 and 7, is ***not*** one of under-achievement.

Table 3: GCSE Results -Leeds LEA 1994

Percentage of Pupils attaining A-C grades in Mathematics, Science & English

				Gender Differential	
				Average Point Score	
Ethnic Origin	**Mathematics**	**Science**	**English**	**BOYS**	**GIRLS**
African	50	50	50	3.12	5.79
African-Caribbean	**7**	**9.3**	**27.5**	**1.99**	**2.63**
Bangladeshi	24.1	20.7	32.3	3.26	3.58
Indian	31.8	28.3	46.5	3.63	3.68
Pakistani	19.2	18	21.4	2.65	2.88
White	35.2	38.9	47.5	3.35	3.66
Chinese	42.9	50	42.9	3.33	4.68

Table 4: The Equality Gaps - Birmingham LEA 1995

Percentage difference from LEA average in the 3 Core Subjects: English, Mathematics & Science

	Baseline Assessment	Key Stage 1	Key Stage 2	GCSE
African-Caribbean	**+20**	**+3**	**-2**	**-21**
Bangladeshi	-45	-24	-23	-17
Indian	-5	+8	+4	+14
Pakistani	-43	-17	-10	-15
White	+10	+2	+3	+6

Tables 3 and 4 show how far African-Caribbean pupils have fallen behind their peers, from other ethnic groups, as they progress through the education system, particularly in Mathematics and Science. Their early achievement at ages 5 and 7, in Mathematics and Science, does not progress at an appropriate rate, to ensure comparability at GCSE level and beyond, and is in sharp contrast to their achievement in English. In a totally opposite trend, Pakistani and Bangladeshi pupils at Baseline and Key Stage 1, are well behind African-Caribbean pupils, but at GCSE, they have not only caught up, but are well ahead of them. Indian pupils at Baseline and Key Stage 1, are behind African-Caribbean pupils, but at GCSE, they are far ahead of them. African and Chinese pupils have a more consistent pattern of achievement. Their high levels of achievement at Key Stage 1, are maintained through to GCSE level.

This is also irrefutable evidence of the growing differential in achievement between Black boys and girls, whereby Black girls are achieving at almost twice the level of the boys. It is particularly disturbing that Black pupils are the racial groups with the widest differential in achievement by gender. No other racial group has such a major gap in gender-biased achievement.

Table 5 shows the average points score for each subject area, by ethnic group, at GCSE (age 16), for the County of Berkshire, in 1995. This is the only LEA that undertook ethnic monitoring, across all subject areas, thereby enabling more conclusive trends and patterns to be identified. **Table 5** further confirms the subject-based disadvantage of African-Caribbean pupils in Science and Mathematics, showing that the greatest differential in average point scores between African-Caribbean pupils, and white pupils, is in Science.

Table 5: Berkshire County LEA-GCSE Results 1995 - Average points per candidate by subject group & ethnicity

Ethnicity	English	Languages	Maths	Science	Technology	Art & Music	Humanites	Other
White	**10.01**	**5.54**	**4.32**	**9.22**	**5.11**	**4.62**	**4.55**	**4.29**
Black African	8.67	5.50	3.53	6.73	4.30	3.20	3.69	4.00
Black Other	10.76	5.09	3.57	7.19	4.53	5.57	3.91	3.71
African-Caribbean	***8.10***	***3.84***	***2.99***	***5.73***	***4.89***	***3.69***	***3.26***	***3.22***
Indian	9.56	5.23	4.25	8.70	6.46	4.57	4.36	4.27
Pakistani	7.81	4.40	3.17	5.96	5.19	3.69	3.54	3.89
Bangladeshi	8.00	3.25	3.17	7.56	5.19	3.17	3.67	3.40
Chinese	10.33	5.21	5.07	9.87	6.85	5.50	5.00	4.60
Other	10.18	6.30	4.46	9.36	5.25	4.46	5.08	5.00
Not Known	9.03	5.43	3.94	8.23	4.47	4.36	4.07	4.19
ALL	**9.74**	**5.45**	**4.20**	**8.89**	**5.08**	**4.53**	**4.42**	**4.26**

Qualitative Research

Interview Study of Parents, Pupils and Teachers

Having obtained and analysed the detailed data on achievement in the core subjects, we then undertook qualitative surveys which aimed to identify the factors, that contributed to this subject-based disadvantage, of African-Caribbean pupils in Mathematics and Science. The methodology utilised involved focus group interviews/discussions with separate ethnic groups, of parents, of pupils, and teachers; semi-structured questionnaires for each of these discrete groups; and a comparative analysis, to compare how different ethnic groups of parents and pupils experience education in Britain. This qualitative survey was carried out in the metropolitan cities of Birmingham, Leeds, Wolverhampton, Liverpool and Manchester, over a period of six months (March - August 1996), and involved 250 parents, 150 pupils (age 11-16), from 12 (multi-ethnic) secondary schools, and 210 Mathematics & Science teachers, including a cohort of 40 Newly qualified teachers (NQT's). The schools/pupils/parents were all from inner-city wards. This qualitative aspect, enabled the ethnic/gender patterns of achievement, identified from the quantitative analysis of examination results, to be explored.

Analysis of the interview study revealed seven key factors which our range of informants perceived as contributing to Black pupils' failure in Mathematics & Science: Curriculum access; teacher expectation; parental involvement; role models & cultural identity; careers guidance; post-16 progression into Further & Higher Education and employment; and initial teacher training (ITT).

The following sections discuss these seven factors, drawing upon the interview and survey data and other relevant research in each area. A case study of 'School X' concludes the empirical sections.

Curriculum Access:

Racism and anti-racism in Mathematics & Science Education

The National Curriculum in England and Wales, is based on a prescriptive, content and process-driven view of Mathematics, Science & Technology, as a result of which, issues of access to the Mathematics, Science and Technology curriculum for all students, have been dismissed as the concerns of a political minority. And yet, the Education Reform Act requires that all students have access to a 'broad, balanced and relevant curriculum' *and that this access is taken up by each individual.*

The processes of learning Mathematics and Science should contribute to children's 'transferable skills', enabling them to be able to think critically and hypothetically, about issues including racism and equality, and their role in a multi-cultural society. It is clear, however, that many teachers feel unable to take this step from the exploration and understanding of science, to the exploration and understanding of society. This will come as no surprise if we consider how science is regarded, and how little the debates about the role of science in society, including the thirty year old debate about 'race', and the contributions that other cultures, and world views, have made to our understanding of the world - have been addressed by mainstream educationalists.

The view is sometimes expressed that of all disciplines, mathematics is the most culture free. Mathematical structures are, after all, essentially abstract and have their own internal consistency, and so they do not depend on the culture and context in which they are taught and learned. The consultation document on the

National Curriculum proposals for Mathematics (1988), included a short section entitled 'Ethnic and Cultural Diversity'.

This section explains that:

... priority must be given to ensuring that they (the pupils) have the knowledge, understanding and skills which they will need for adult life and employment in Britain in the twenty-first century.

This then, is the argument for not including any so-called multicultural topics in the attainment targets. Thus, school mathematics is to be directed firmly towards the 'mainstream' of British society.

On the whole, textbooks and other resources for teaching Mathematics and Science, have been produced with little awareness of the dangers of reinforcing racist stereotypes. The situations used as examples, the people in the texts, the roles they play, and the pictorial illustrations, all contribute to this. A recent study by Job Francis (1997), an African-Caribbean mathematics teacher in a predominantly Black secondary school in Birmingham, for his M.Ed. thesis, confirmed the extent of this problem in British Textbooks/Examination Papers. This research was modelled on the previous survey of Black images in 17 College/high school maths/physics textbooks, by Dr. John Pappademos, Professor of Physics, University of Illinois (in Van Sertima, 'Blacks in Science', 1983), in the United States. Francis analysed 33 Mathematics textbooks and 9 examination test papers, currently in use in his school, and in another large inner-city multi-ethnic secondary school in Birmingham, to assess, whether these books had the potential to reinforce racial stereotypes, which subsequently denigrate the intellectual and mathematical/scientific abilities of Black pupils. The method utilised in his survey, involved the examination of each page and noting, by way of a tally mark, when an image appeared, either in the form of a picture, caption or illustration.

Francis found that of the 562 pages which showed images, only 29 pages showed images of Black, Asiatic, and other non-white racial groups. *Of those images shown of Blacks, a similar pattern to that observed by Pappademos occurred, in that there was praise and or extensive discussion of the work of European scientists and mathematicians (Levoisier, Achtar, Dalton, Koch, Newton, Currie etc.), but this mark of respect and acknowledgement, was not given to a single non-white scientist or mathematician. The most prominent images of Blacks presented were as athletes or musicians. The stereotypical role of Black women in servitude, and Africa as a poorly-educated, emaciated populace is also portrayed.* As in the case of Pappedemos, *neither a single scientific or mathematical discovery, was identified or pictured, as being of African origin, nor is a single Black scientist credited with a scientific contribution.* The message suggested by Jenner (1988) that *'only white boys participate in Maths'* is still implied by these mathematics books in Francis's survey. Francis's results are particularly disturbing, given the nation-wide popularity of this particular Mathematics scheme/Examination papers, in many secondary schools in Britain.

Torkington (1996) defines this process as the *'social construction of knowledge'*, whereby *ideas which emanate from powerful groups or individuals will be presented as objective knowledge. It is ultimately this knowledge which forms the basis of commonsense understanding, making people in a given society feel and believe, that this, is the only truth.*

She then goes on to assert that, *in order to challenge what is currently accepted as knowledge, one must review knowledge from the perspective of disempowered groups. The feminist critique arose from this kind of reasoning.* This reasoning informed Van Sertima's Book (1989), 'Blacks in Science', whose impact on mainstream society, *'has made the whole ground, upon which conventional studies of Africa*

have been built, rock violently, and this is only because, *'the nerve of the world has been deadened for centuries, to the vibrations of African genius.'*

The impact of Zaslavsky's Book *'Africa Counts'* (1979), on the contextualisation of the socio-mathematics of Africa, has been similarly challenging.

The evidence about how 'race' has been discredited as a scientific concept, and how it has been used as a tool, for generations of discrimination against non-white communities and societies, has long been available to scientists and teachers. Global approaches have shown how other cultures' use of technology, and the knowledge they have acquired outside the scientific western framework, is a rich seam to mine in the classroom. Publications such as the Association for Science Education (ASE)'s *Race, Equality & Science Teaching* books, and the Mathematical Association (MA)'s *'Mathematics in a Multicultural Society'* - have attempted to show how these perspectives can be brought directly into the curriculum, in ways that can enhance relevance and interest for students in science and mathematics, and involve them in making links for themselves about the global contexts of science and mathematics, their inherent contradictions, and the impact that scientific 'advances' have had on the world and its inhabitants - human and non-human. It is thus unfortunate to find in our survey, that none of the mathematics and science educators, consider these issues to be of concern to their everyday professional lives, and none of them utilised these materials from the ASE and the MA, in their multi-ethnic classrooms.

Teacher expectation:

Teacher/pupil relationships

There is now firmly entrenched in most white teachers minds in Britain, what we in the African-Caribbean Network for Science & Technology, define as *'a racial hierarchy of teacher expectation', which is a kind of subversive racial pecking order that operates in most schools. Asian and white pupils are expected and even encouraged to achieve in Mathematics, Science & Technology; while Black children are expected and overly-encouraged to achieve in non-academic subjects like Sports, Music and the Arts. This racial-stereotyping is now endemic in British schools, and a considerable amount of effort will be needed, to challenge and change teachers' attitudes and expectations of Black pupils, in Mathematics and Science subjects.* (Rasekoala, 1997)

The impact of this negative stereotyping of Black pupils, is even more profound, given that over the course of time, many 3rd, 4th and 5th generation Black pupils, have now unfortunately, internalised these expectations of failure, and are left with nagging doubts, of their true academic potential, with a feeling, as articulated by a pupil, *"that no matter how hard you work in school, even when you get praised by teachers, you are never sure that you have reached your full potential. There is always that doubt, and you're never sure."*

There is a growing body of evidence regarding the deteriorating nature of the relationships between Black pupils, and white teachers in schools; A recent national poll undertaken by Amenta Marketing (Research) ltd[4], shows that nearly four in ten Black children, would prefer to attend an all-Black school, while one in five think they have recently suffered racism from a teacher. Gillborn & Gipps (1996) in their recent review of research on the achievements of Ethnic minority pupils, indicated that:

- *Black pupils are four to six times more likely than their white peers to be excluded from school;*

- *qualitative research frequently points to a relatively high level of tension, even conflict, between white teachers and African-Caribbean pupils;*
- *Despite their shared position as 'minorities', African-Caribbean and Asian pupils can be subject to different expectations. Teachers often view Asian pupils as being better behaved, more highly motivated and of relatively higher ability in comparison with African-Caribbean pupils;*
- *Qualitative approaches reveal a considerable gulf between the daily reality experienced by many Black pupils, and the stated goal of equal opportunities for all.*

Similar findings have been reported from other research, the Leicestershire African-Caribbean Survey found that, *'a high proportion of Black children do not enjoy or like school, for reasons such as lack of material about Black culture and history, unfair treatment, and the failure of teachers to understand or appreciate the experiences of African-Caribbean children.* (Lyle et al, 1996). Vance (1997) has reported similar experiences in the Lambeth Raising Achievement Project. His discourse on how white teachers, in defining the idealised pupil, *create the Black pupil as the 'bete noir', the pupil who does not subscribe to their ethos, and thus, forced to become the outsider,* is illuminating. Pam Smith's[5] research in schools in Croydon(1997), is refreshing in letting Black pupils articulate in their own 'language', their feelings and experiences regarding relationships with white teachers.

Parental involvement:

The Rage and despair of Black parents

Contrary to negative mainstream perceptions of African-Caribbean parents, the education of their children, is of the greatest concern to Black parents. Unfortunately, just as the relationship between white teachers and Black pupils has deteriorated, so has that between white teachers and Black parents. Black parents admit that they do need to become more involved in their children's schooling, but often do not find schools welcoming, or prepared to offer necessary advice and support. *There is a growing militancy among Black parents, borne of frustration and despair at the continuing deterioration of their children's educational fortunes. They (Black parents) are finding it increasingly hard to accept such low levels of educational attainment, especially as education and schooling, are given such a high priority within the community* (Lyle, et al, 1996).

For Black parents, it would seem that the education system is at fault, and it is of little surprise that *56% of Black parents in the Leicestershire African-Caribbean survey, believe the education system is failing Black children. This dissatisfaction is now finding an outlet in the growing interest among Black parents, for separate Black schools, as exist in the United States. 39% of the Black parents in the survey supported this proposal* (Lyle, et al, 1996).

The difficulties African-Caribbean parents have in establishing positive relationships with teachers, is further compounded by their poor attendance record, at school meetings. Our findings showed that African-Caribbean parents had the poorest attendance records at Parent's-Teacher Association (PTA) meetings, and end-of term pupil performance reviews. Next worst were Pakistani parents, then White parents, and the best attendees were Indian, Bangladeshi, African and Chinese parents.

When we asked African-Caribbean parents about the reasons for their poor attendance, they gave the following : Lack of confidence in approaching schools and teachers; the use of too much education jargon by teachers; their own lack of educational achievement; and pessimism regarding the educational outcomes of their children. This comment was atypical of many of the African-Caribbean parents " *I'm tired of*

always getting bad news. They never tell me anything good about my child, so what's the use of going? It just depresses me even more."

We found that on the part of schools, this non-attendance was not understood by most teachers, and ended up giving a negative impression, implying a lack of interest by African-Caribbean parents in their children's educational achievement, which couldn't be further from the truth. On the other hand, Black parents felt they could not win, because when they did go into schools to intervene on their child's behalf, they were perceived as being aggressive trouble makers, by teachers.

We also found a generational differential in the attitude of African-Caribbean parents, which was not there in Asian parents. The older generation of African-Caribbean parents (grandparents) had come into the education system with an overwhelming trust, based on their experiences in the Caribbean. They believed that British schools would do a good job of educating their children. Unfortunately, their high expectations and high aspirations were never realised for their children, and they were disappointed. Their children, who are now the parents of the Black children in schools, have literally in one generation, shifted from one extreme of overwhelming trust and high expectations, to despair and pessimism. They fear for their children's educational outcomes, due to their negative experiences of the education system, and feel that there is very little they can do to change the system for the better. This same downward generational trend was observed to a smaller extent in some white working-class parents.

African parents were the most demanding and assertive group of ethnic minority parents, as confirmed by this comment, from the Headteacher of a Manchester school, *"African parents will not allow my teachers to get away, with the kind of racist nonsense, that they get away with, with African-Caribbean parents. This makes my job easier as a Head, and that is why, I will take in my school, all the African children I can get, but I don't want African-Caribbean children, because their parents will not always support me effectively, in challenging teachers' inherent low expectations of their children."*

Nature of parental involvement in schools

In our survey, Black parents were the least informed of all parent groups, in terms of what the mainstream education system is about. For example, only 5% of Black parents knew what the three core subjects were, compared to 65% of white parents and 85% of Asian parents. White and Asian parents were far more informed, but while most white parents had got their information from teachers in schools, Asian parents in the main, had not been informed by the schools, but by their own community networks. In other words, schools were doing a very poor job of informing all ethnic minority parents, about the education system, and Asian parents were simply fortunate, that they had an alternative and effective network, in their community, which kept them well informed. Unfortunately for Black parents, there are no such networks within their communities, and they remain largely ignorant of the system, and how it operates. This they believe, has a major impact on their ability to effectively support their children in schools, and leaves them feeling frustrated, cynical, suspicious and disempowered.

The despair that many African and African-Caribbean parents feel about their children's educational outcomes, particularly in numerate and technical fields, has led some of them to undertake the desperate measure, of sending their children to schools in Africa and the Caribbean. African parents in particular, have grave fears that their British-born children will be denied the genuine opportunity, to achieve the high levels of numerate and technical qualifications and skills, with which they came to Britain. It is a supreme irony that Black parents living in Britain, have to send their British-born children, to schools in Africa and the Caribbean, in order that they will have a genuine opportunity to acquire numerate and technical skills and qualifications, which they can then bring back to work in the UK.[6,7,8]

Black Youth : Role Models & Cultural identity

Science, Engineering and Technology (SET) & Role models

The Scientific community in which myself and many other Black professionals have worked for so many years, has woefully failed to address this issue. Our disappointment at the paucity of the exposure given to Black professionals in SET, has been profound. Most of the promotional materials, literature, posters and leaflets produced to promote SET, rarely ever include pictures of Black people. Government initiatives in this area have been just as remiss, in providing role models of Black people. A recent brochure commissioned by the Government Department for Trade & Industry (DTI)'s, Action for Engineering initiative, and sponsored by the Engineering Council and other SET bodies, entitled, *'Engineering for Life'* did not include a single representation of any ethnic minority people, while fully addressing gender issues, with many representations of women in engineering. Why the continuing double standards and oversight? Is it any wonder then, that most Black youngsters come to the unfortunate conclusion that science and engineering is only for white pupils?

Cultural Identity & Integrity

African & African-Caribbean pupils did acknowledge some of the difficult 'baggage' that they were bringing into schools. Boys in particular, articulated their disappointment that most successful Black male role models, seemed to be lacking in Black cultural integrity, and therefore, could not relate to where, they as Black youth, living in the inner-city, were coming from. This was a typical comment from many of the Black boys: "*They (Black male professionals) marry white, or live 'white', so how can they show me, how to be a successful 'Black' man?*" These youths did very much aspire to the enhanced lifestyles of these role models and their material rewards, but deplored what they perceived, as the 'high price' that these Black male professionals had 'paid', to achieve their status in mainstream society.

"*They've sold out man!*" This perception and belief, created in some of these young Black males, a 'fear' of success, a tension, and a holding back of their aspirations, because of the 'high price' in terms of their Black cultural integrity, which they believed, would be the trade-off for their advancement in mainstream society. This 'fear' was rendered all the more powerful, because it was largely unspoken, and rarely shared with the adults around them. It was something they only discussed among themselves. In the absence of 'holistic' Black male role models, the boys' looked to each other for guidance and support, and thus, peer pressure becomes overwhelmingly paramount, and extremely difficult to resist, even when negative.

It is interesting to juxtapose the frustration of successful Blacks, at the 'price' they have to pay, to achieve in mainstream society, with these perceptions of them, by Black youth. In his fascinating and moving book, based on interviews with successful Blacks in the US, *'The Rage of a Privileged Class'*, in which every Black professional living in the Northern hemisphere, will readily recognise some aspects, if not, whole paradigms, of their daily working lives, Ellis Cose (1993) pulls away the 'mask' of the happy, fulfilled, successful Black professional, and reveals the hidden rage, and the identity crisis, that many of them face. Many admitted to having paid the 'price' of cultural identity/integrity, through deciding in their upward mobility, *that they could no longer afford to be Black.* This candid quote illustrates this 'rage', so well:

'Think of how much a Black person has to sell of himself, to try to get race not to matter..... You have to ignore the insults. You have to ignore the natural loyalties. You have to ignore your past. In a sense, you have to just about deny yourself.'

For many of these successful Black professionals, part of that 'price' has been accepting the fact that their race was not seen as an asset, but as something they had to overcome, in order to fit in, and really belong in mainstream society. This was the 'golden prize' held out to them, as an insidious reward, for giving up, being 'Black'.

This failure by Black professionals, to deal straightforwardly with the pervasive practices of exclusion, is defined by Prof. Patricia Williams[9], *'as the short-circuiting of the process of resolution, whereby, for Black people, the systematic, often nonsensical denial of racial experiences, engenders a sense of split identity; attending that which is obvious, but inexpressible; an assimilative tyranny of neutrality as self-erasure. It creates an environment in which one cannot escape the clanging symbolism of oneself.'*

Most Black girls on the other hand, whilst sharing this resentment, at the 'selling out' of Black professionals, did acknowledge that it was very much a male-dominated trend, and they could relate to far more 'holistic' Black female role models. This they believed, gave them their edge over the boys, in terms of achievement. They recognised the boys' 'fear' of success, but affirmed their liberation from that 'fear', because they could relate to successful Black women who lived in their communities, and even when geographically outside it, were still very much involved with it, in terms of their lifestyles, and personal relationships. The Black girls did not hold back on their aspirations, since, in sharp contrast to the boys, they believed that they could be successful Black women, and still retain their cultural integrity.

These issues might seem controversial to some, but it is important that we provide young people with a genuine opportunity to tell us what they are experiencing, and feeling, irregardless of whether we agree with what they have to say. The insights that we gain from these discussions with these young people, will enable us to shed more light on the multi-layered and complex tensions which they are dealing with, if we are to genuinely come up with effective strategies, to support their achievement. It was poignant for me, that on a number of occasions, when I interviewed these groups of Black youngsters, they asked for photographs of my children, before they would speak to me freely. They wanted to 'check me out' as they put it. It is crucial as Ellis Cose suggests in his book:

'that we take our hands away from our eyes and recognise, at the very least, that exhorting Blacks to escape the ghetto, then psychologically battering those who succeed, is a sure prescription for bitterness. Honest dialogue may not be a solution. But it is certainly preferable to censorship that passes for civility'

The Role of the media, and Cultural Cohesion

For the Black youth, their disenchantment at the seeming lack of cultural integrity in some of their Black role models, was further compounded, by their profound disappointment at the media's poor and stereotypical representations of Black people. Black youth are just as much, major consumers of the multimedia age, as their white and Asian counterparts, but feel very much let down by it. Comments like this, were atypical : "*The only time you see a Black person on TV, is when they are doing sports or music, or as criminals. You never see them as doctors, or lawyers, or doing anything important.*" This they believed, made it much harder for them to challenge teachers' low expectations of them, and depressed their morale and aspirations.

African youngsters expressed similar frustrations, but affirmed a stronger sense of cultural cohesion, due to the strong links their parents maintained with Africa, and their visits there.

"*On the TV, they never show anything good about Africa. It's always fighting and people starving. I've been to visit my family in Ghana, and it's not like that. It was really nice, and I saw Black people doing all the important jobs everywhere.*"

This natural sense of empowerment and confidence, from being exposed to Black people in a variety of roles, status, and jobs, was of the greatest positive impact on the morale of British-born African children, regarding their visits to Africa. Their parents noted a marked positive change, in their educational achievements and career aspirations following these visits, and many African parents see these visits as more that just a holiday for themselves and their children, but as a powerful tool, with which to sustain their children's educational achievements and high aspirations, particularly, in numerate and technical fields. A parent used the analogy of an "*antidote to a poison*", to describe what these visits to Africa, meant to her and her children. Many parents saved zealously, and sometimes even went without, to afford these visits to relatives in Africa. African-Caribbean parents and youngsters, expressed similar benefits from their visits to the Caribbean.

Asian pupils expressed the strongest sense of cultural cohesion and confidence, which they believe, very much underpins their achievements and aspirations. They understood the 'fear' of success in their Black colleagues, but were very much free from it, as their male and female role models, were an intrinsic part of their communities, and thus shared their 'lifestyles' and cultural integrity. They did not subscribe to any notions of successful Asians 'selling out'. If anything, they gave more to the community. While sharing the frustrations of their Black colleagues at the poor representation of ethnic minorities in the media, they did acknowledge, that the images of Asians, did tend to be more positive, than those of Black people.

The strongest frustrations were expressed but some Asian boys, regarding the flip-side of racial stereotyping in schools and mainstream society, whereby they were only expected and encouraged, to achieve in numerate and scientific subjects, while on the other hand, being perceived as lacking in creative and artistic skills. Many Asian boys, who are as football and music 'mad', as their white and Black peers, were very disappointed at the lack of support and encouragement they received, from teachers in these fields. "*We never get to go on the school football team, we practice just like the others, but Sir never puts any of us on the team. It is always the Black boys that get on the team.*" Similar frustrations were expressed regarding Arts and other humanities subjects, like Drama and Music. Asian pupils wished that in an ideal world, they would be free to develop their interests in the various fields, without effectively being excluded from creative and artistic subjects.

Muslim pupils (Pakistani & Bangladeshi) expressed concerns that their educational achievements were depressed in comparison to other Asian pupils, because they were having to deal with the additional 'baggage' of the 'anti-muslim' factor in British society, and thus in schools. They believed that some teachers perceived them differently, and negatively, because they were Muslim. See[10]

White pupils (in the main, from working-class backgrounds), expressed a very similar 'fear' of success, to that of Black boys. They had a strong and positive sense of their working class culture, which they shared with their mates, and which they perceived, they would have to sacrifice, in order to achieve 'success', and thus end up becoming, the 'middle-class toffs', which they despised. They shared the same foreboding of mainstream success which Black boys expressed. There was always a 'price to pay'. Again, this fear was all the more powerful, because it was largely unspoken, and rarely shared with the adults around them. Many of the white teachers in our survey, could relate to this 'fear' in their white pupils, as many of them,

had come from working-class backgrounds, and a significant number, had been the first in their family, to go to University. A Teaching Career had seemed then, the most readily accessible, professional, upwardly-mobile route, out of the working-classes, and many, had taken up that option. They acknowledged a sense of alienation from some members of their families, who saw them as having 'sold out' in becoming 'middle- class', and many lived their lives in a 'selective amnesia' of their working-class backgrounds, desperately hanging on to their newly acquired middle-class pretensions.

Careers Guidance:

The role of the Careers & Guidance Services, is pivotal in directing the aspirations and career choices of many African-Caribbean youngsters, in the post-16 environment. Our research uncovered major failings of Careers officers, in providing Black youngsters with positive career paths. Many Black parents complained of their children being encouraged into low status and low skilled careers, in the Service industries, like Catering, which were not commensurate with their qualifications. Black students are rarely encouraged by Careers Officers to take-up careers or further study in numerate or technical fields, even when they are more than qualified, interested, and suitable, for these career and study paths. *There is very strong evidence once again, of racial stereotyping, with Black youngsters being over-represented in the take-up of non-academic NVQ/GNVQ courses (25% compared to 12% for White pupils and* 15% for *Asian pupils) and very much under-represented in academic 'A' level courses (13% compared to 32% for white pupils and 27% for Asian pupils)*[11]

To illustrate this, I will quote a letter sent to me on the 5th of February 1996, by a young Black student in Liverpool.

'Dear Mrs Rasekoala,
I am a student studying A-level mathematics, chemistry, physics and general studies. My intended career is chemical engineering and as an African, I have fears of taking this course. I read an article on 'The African-Caribbean Network for Science and Technology' and I would like to have more information about this, especially about possible universities and job opportunities for chemical engineering in the UK. Thank you.'

There was no name on this letter, just a Liverpool address in Toxteth. My distress on receiving this letter, prompted me to go to Liverpool on the following Sunday, to look for this young person. On meeting this student, and her family, I was dismayed to hear their horror stories of the experiences, that had led to this girl's desperation in writing to me secretly. Student X (to protect confidentiality) is a very bright, very able and committed Black girl, who, because of her academic ability, is attending a selective state school, which is in the top ten nationally. She and her parents, told me of the major difficulties they had encountered from some teachers in her school, and the Careers Service in Liverpool, in getting any information and support, regarding her career aspirations, to study chemical engineering at University. At every step, they encountered racial stereotyping and put-downs, such as "why don't you go in for a Catering course?", and "why not go in for teaching, and teach Chemistry?" etc. The message to them was loud and clear. Yes, we accept your daughter is bright, but we think she is overreaching herself, and we will only offer you support, when her aspirations, conform to our low expectations.

Through the support of our organisation, Student X received prospectuses from a number of universities with Chemical Engineering departments, filled in her UCAS forms, and is now completing the first year, of a three-year degree course, at a University in the Midlands. Her story is so distressing and frightening, because it poses the question: "if this is the support that our brightest and best youngsters, are getting from

the education system, what hope is there for the less able and committed?" Student X's case is typical, of the many phone calls and letters, we receive from Black parents and students.

The Post-16 Progression route:

Where are they? The missing Black undergraduates in SET departments and faculties, in Britain's universities and Colleges.

If you look around any science, mathematics, engineering or numerate department, of any college or university in Britain, you will find a curious phenomenon. At undergraduate level, you will be lucky to find a handful of Black students. Asians, yes, Chinese, yes, but not Black.

Then look at the postgraduate courses. Suddenly, there are healthy numbers of Black students. But they are not British-born. They come mainly from west and east Africa, where they have undertaken their first degree courses. They come to Britain to get their postgraduate qualifications, and join departments where they find themselves, the only Black students.

I was one of such postgraduate students, undertaking a Masters' degree in Chemical Engineering, at UMIST in Manchester, thirteen years ago, and have been working in British industry, where once again, I have found myself to be the only Black employee at senior management level, over many years. My course supervisor, back then at UMIST, in reply to my outlining this curious phenomenon to him, answered with rare candour and disgust, "*Liz, its the British disease, hypocrisy. Everyone knows about this problem, but no one wants to talk, or do anything, about it. It is ridiculous that Black students like yourself educated in Africa, with an education system copied on the British model, should be able to come here and excel on our Science & Engineering post-graduate courses, while Black students born and brought up in MossSide, across the Mancunian Way, and just a stones' throw from this building, will never come here, not because they lack the ability, but because our education system, effectively excludes them from Science & Technology. It is a disgrace!*"

The post-16 data we uncovered, shows that the grim harvest of subject-based underachievement in Mathematics and Science, which African-Caribbean students reap at 16 (GCSE), simply haunts them all the way through the Further Education (FE) and Higher Education (HE) sectors, blighting their progression routes, outcomes, and employability, in the highly competitive graduate employment market.

Higher Education (HE) Entry: Subject[12] and Age profiles

Table 6: Analysis of UCAS admissions to HE institutions (1990-1992), breakdown by subject (Humanities/Numerate) courses.

Proportion of students undertaking numerate (including SET) courses at HE

Ethnic Origin

Chinese	92 %
Indian, Pakistani and Bangladeshi	75 %
White	48 %
African	55 %
African-Caribbean	**3 %**

The ***age profile*** survey of Clara Connolly (1994) using the same 1990-92 university entry data, shows that:

'nearly half of white male and over half of white female applicants enter HE at 18, while Chinese, Indian and Bangladeshi applicants tend to enter a year later. However, only 6 per cent of African-Caribbean men enter at 18, and nearly 40 per cent are over 25. 30 per cent of African-Caribbean women are also over 25 upon entry'.

Our subject survey supports Connolly's assertion that the phenomenon of Black over-representation in HE (Taylor, 1992), is misleading, and needs to be qualified in terms of differential entry-age patterns, and we add, under-representation in Numerate and SET courses. It is crucial that the 'good news' story of Black overrepresentation in FE & HE, be revealed for what it is - a Hype! Many Black graduates are discovering when they apply for jobs, that in the used car parlance, they have been sold a 'Lemon' rather than a 'Peach'.

The current hype regarding the overrepresentation of Black and Ethnic Minority students in HE, conceals some major fundamental flaws, regarding the ghettoised nature of this over-representation. Success in terms of participation, which is analysed on the simplistic premise of the numbers of ethnic minority students entering, is inadequate in shedding light on this complex issue.

The over-representation of African-Caribbean students on arts and humanities courses, means that they are most vulnerable, to the growing spectre of graduate unemployment. With ever growing numbers of them in HE institutions, their disillusionment is profound, when they realise they have been short-changed, as their degrees are far less impressive to employers. The fact that their white and Asian counterparts had been similarly short-changed to a smaller degree, is of scant consolation. Universities who claim to be champions of equal opportunities, would do well to put more effort into enabling Black students onto their numerate and SET courses, than they put into simply enrolling more Black students.

Further Education (FE): Access and Equality?

The FE sector does not offer much that is worth commending. The proliferation of Black Access courses in this sector, has had a minimal impact on the participation of Black students in Numerate and SET courses at HE. The reason for this is all too clear. These courses have become a patronising second-class academic ghetto, for Black academic staff, as well as students. The paucity of Black Access courses in mathematics, science and technology is breath-taking. In our survey of Black Access courses, in FE colleges in; Manchester, Leeds, Sheffield, Liverpool, Nottingham, Derby, Leicester, Birmingham, Northampton, Wolverhampton and the London Boroughs of Southwark, Wandsworth and Hackney, we found not a single Black Access course, that provided a numerate or technical pathway into HE. They all provided the same limited route to HE; the Arts and Humanities, with a Curriculum over-dominated by Black History and Black Studies modules. What is most disconcerting is the Alice-in-Wonderland absurdity of these courses, since the same institutions, provided technical and numerate pathways on their general access courses, which were mostly taken up by white and Asian students.

Emma Westcott (1996) of the Association of University Teachers (AUT), explains why these inequities, should be a major concern, to all HE staff. *Higher education entry and graduation, are significant performance indicators for secondary education. The predominance of mature entrants from Black groups, suggests that at present, many reach university, in spite of their schooling.* She then goes on to add, *higher education is the only route into a number of professions, which have for too long, been impoverished, by the absence of ethnic minority members, notably Law, medicine, engineering architecture, and not least of all, teaching.*

Many of these Black Access students end up, if they successfully complete their courses at HE, in limited career fields such as, Social Work, Youth & Community work, and the caring professions. Of course, the very process of taking access courses, means that Black students are starting university, four to five years later than their White and Asian counterparts, putting them at a further disadvantage, when it comes to getting jobs, where employers will prefer the younger, more numerate candidates.

Graduate Employment: Market Forces?

As an ex-participant on the Graduate Employers Forum, I know only too well that Employers are a lot more clued on, to the gimmicks of the FE and HE sectors, and are quite shrewd in their discernment of which 'pieces of paper' are actually worth anything. They are unashamedly biased in favour of younger and numerate graduates, who are cheaper to employ, and far more amenable to being multi-skilled, particularly in the new technologies. Is it any wonder then, that Black graduates experience much higher levels of unemployment than their White or Asian counterparts, and are disillusioned regarding the benefits of their years in HE? Their profile hardly begins to match what most graduate recruiters are looking for.

HE: The 'Colour Blind' Approach in Teacher Training

In a sense, the HE sector is reaping what it has sown. Many postgraduate departments in SET faculties have enjoyed many fat years of complacency and smugness, feasting on the rich harvest of their African and Asian overseas students. The same 'colour-blindness', which is prevalent on most University Initial Teacher Training courses, ends up producing, primary and secondary teachers, who perpetuate in our schools, the subject-based disadvantage in Mathematics and Science, of Black students. Thus the viscious circle is completed!

It is deeply worrying that as concerns have grown over the decades, regarding the educational disadvantage of African-Caribbean pupils, the framework for the Initial Teacher Training (ITT) Curriculum, has significantly reduced the scope for the inclusion of multi-cultural and anti-racist education, in the preparation of newly qualified teachers (NQT's). Turner & Turner (1987) have shown that university departments of education differ greatly, in the priority they attach to multicultural education. Cole (1989) found that, *21 out of 51 B.Ed. students (34%) surveyed during their first week, at a teacher training institution, in the South of England, gave responses, which he categorised as 'Intentionally Racist', and a further 8 (13%), 'Unintentionally Racist'.*

Issues related to ethnic diversity and racism in schools, have never featured highly in teacher education in Britain. Recent moves to shift initial teacher education into schools, have further weakened the situation. Reiss (1994), conducted a study to investigate the levels of awareness/views of Post Graduate Certificate of Education (PGCE) Science students, on multicultural/anti-racist science education. This study was conducted with two different cohorts of PGCE science students : one in 1990, the other in 1994. Reiss's findings showed that, the 1994 cohort, were less well informed about certain aspects of multi-cultural /anti-racist education, than the 1990 cohort of students. The intervening four years were a time of great educational change in England and Wales, with the time PGCE students spent in higher education, on their PGCE course, substantially reduced, in favour of longer school-based placements. He adds, *it is most unusual, in my experience, to find PGCE science students demonstrating a multicultural or anti-racist perspective in their teaching,* and while accepting there might be mitigating reasons for this, goes on to assert that, *the particular contribution of higher education in respect of multicultural/anti-rascist education, may be to enable students, in a setting temporarily removed from the pressing exigencies of*

everyday life in school, to explore their own understandings, and develop an appropriate conceptual framework.

In our Mathematics & Science teacher cohort of 40 newly qualified teachers (NQT's), responses to our questionnaire, revealed that while 80% of them had undertaken school-based placements in Multi-ethnic schools, 97% of them had received no formal training on multicultural/anti-racist Mathematics/Science education, during their time in teacher training. This applied equally to those who had undertaken the one-year PGCE course, and those who had undertaken the three-year B.Ed. course. Many of these NQT's expressed their disappointment and sense of 'betrayal', at this omission in their training, especially in view of the fact that most teaching vacancies, had turned out to be in the multi-ethnic inner-city schools, for which they had been so inadequately prepared. They felt that they had been set up to fail, and this lingering sense of inadequacy, left them feeling bitter, about their experience of teacher training. Our organisation regularly receives letters and phone calls from NQT's, requesting advice and guidance on strategies for raising the achievements of their Black pupils.

Ethnic Monitoring - The Story of School X[13]

From the early nineties, a growing body of organisations, academics, and Black groups, began to advocate the statutory ethnic monitoring of all examination results, and tests, as a quantitative evidence base, for the educational disadvantage of Black youth, and as a monitoring tool, for the setting of targets for improvement. The Office for Standards in Education (OFSTED) inspection reports, are required to include references to multi-cultural education, equal opportunities, and ethnic-bias in achievement, but very rarely do so, in practice.[14] The Commission for Racial Equality (CRE, 1992), has particularly urged the previous and current administrations, to implement this educational policy initiative. Their pleas, like that of others, have yet to be answered. The usual cop-out given as valid excuses, by successive education ministers, is that statutory ethnic monitoring of examination results, would be too much of an additional burden to schools, already burdened with gender monitoring of the same results. The response of the Chair of the CRE [15] is telling:

'The case for detailed ethnic monitoring is made by what it reveals. When failure is identified, it can be engaged, resources directed, causes discovered and strategies for improvement implemented. For the Department for Education and Employment (DfEE) not to drive this process is a dereliction of duty. The Department has argued that the collection of sufficient ethnic data will be an unacceptable burden on schools. This is Alice in Wonderland logic. The burden is being carried by too many African-Caribbean Children. OFSTED too is unable to determine achievement level by ethnic group, due to the failure of its inspection framework to require sufficient information'.

In the light of the failure of the government to undertake statutory ethnic monitoring of all examination results and tests, the story of how School X, through undertaking this very same 'onerous' exercise, was able to turn around the achievements of its Black pupils, is revealing.

School X, is a medium-sized inner-city comprehensive secondary (age range 11-16) school, in one of the large metropolitan cities in England. It is particularly unusual in that it does not have any Asian pupils. African-Caribbean pupils are the only non-white pupils in the school, and they make up 35% of the school population. Also a significant proportion of the Black pupils (30%), are of 'dual-heritage' origin, that is, having a Black parent, and a white parent.

In 1996, School X appointed a dynamic, ambitious and progressive Headteacher, who was determined to raise standards of achievement in the school. He realised that he would need to substantially improve the achievement of the Black pupils in the school, for this to happen. In his discussions with teachers regarding the under-achievement of Black pupils, he met with a lot of resistance from teachers, in terms of accepting the role they played, in disadvantaging Black pupils in the school. He was also aware of the growing resentment from Black parents, regarding the achievements of their children, and organised a meeting with them, so that they could put forward their concerns. At this meeting, Black parents presented their concerns in four major areas: **Setting/Streaming** - referring to the pronounced tendency for Black students to be found in the lowest achieving groups; **Curriculum Issues** - referring to the non-inclusion of multi-cultural elements in all subject areas; **Exclusions** - referring to high rates of exclusion of Black pupils from school; and **Careers Guidance** - the need for Black pupils to be given informed and empowering career options and choices.

Following this meeting with Black parents, the Head still encountering resistance from teachers in the school, called upon our organisation for help. We suggested that he would need an evidence base, to facilitate any effective dialogue with teachers, and so he made the commitment to undertake ethnic monitoring of all examinations, tests, and the setting/streaming regime in the school. The results, detailed in **Tables 7, 8, 9**, and **10** were profound, and showed the following patterns:

- Black pupils entered the school (KS2- age 11) at a level either above or the same, as their white peers in English, Mathematics, and Science. This position is reversed in Science and Mathematics by KS3 (age 14).
- In English, Black pupils maintain their progress, with Black girls out performing all other groups.
- Black girls keep pace with white girls in Mathematics up to KS3, but fall behind in Science.
- Only in English are Black boys making relatively good progress up to KS3. In Mathematics and Science, they make the least progress of any group.
- With regard to setting, Black pupils are disproportionately placed in middle or lower achieving sets, while the top sets, are predominantly white. (See Table 8).

Table 7: Average Levels of Attainment at Key Stages 2 & 3 in English, Mathematics & Science, by Ethnicity & Gender

		English		Mathematics		Science	
Ethnicity	Gender	KS 2	KS 3	KS 2	KS 3	KS 2	KS 3
Black	Boys	3.8	4.6	4.11	4.53	3.66	4.0
	Girls	3.8	5.2	3.62	4.7	3.62	4.44
White	Boys	3.7	4.6	3.8	5.3	3.7	4.9
	Girls	3.6	4.1	3.75	4.8	3.6	4.7
WHOLE SCHOOL		**3.7**	**4.7**	**3.8**	**4.9**	**3.6**	**4.6**
BLACK		**3.8**	**4.9**	**3.9**	**4.6**	**3.65**	**4.2**
WHITE		**3.7**	**4.4**	**3.8**	**5.1**	**3.6**	**4.8**

Table 8: School X - Setting in English, Maths & Science, by Ethnicity, percentage of pupils in each set. 1996 (1= top set, 5= bottom set)

Year	Ethnicity	English					Maths					Science				
		Set 1	Set 2	Set 3	Set 4	Set 5	Set 1	Set 2	Set 3	Set 4	Set 5	Set 1	Set 2	Set 3	Set 4	Set 5
11	Black	3	24	34	17	21	7	31	17	27	17	0	34	31	17	17
	White	31	18	16	26	10	37	28	13	15	7	37	26	15	15	7
10	Black	32	32	14	23	-	18	27	32	23	-	23	23	32	23	-
	White	28	25	20	25	-	35	27	27	11	-	34	28	20	17	-
9	Black	Streamed					16	29	22.5	10	22.5	10	32	26	32	0
	White						27	25	18	17	14	27	19	23	25	5
8	Black	Mixed Ability					17	34	20	29	-	FORM				
	White						40	21	27	11	-					
7	Black	Mixed Ability					12	26	23.5	38	-	FORM				
	White						35	30	20	15	-					

Table 9: School X - Average Level Improvement Between Key Stages 2 & 3, 1996

Ethnicity	Gender	English	Maths	Science
Black	Boys	1.1	1.0	1.0
	Girls	1.6	1.3	1.3
	Average	**1.4**	**1.13**	**1.1**
White	Boys	1.0	1.65	1.4
	Girls	1.2	1.2	1.3
	Average	**1.1**	**1.48**	**1.35**
WHOLE SCHOOL	Average	1.16	1.39	1.28

Table 10: School X - Key Stage 3 Assessments 1996/7, Percentage of pupils at each Level

		English				Maths				Science			
Ethnicity	Year	Level 3	Level 4	Level 5	Level 6+	Level 3	Level 4	Level 5	Level 6+	Level 3	Level 4	Level 5	Level 6+
Black	1996	30	48	17	4	36	36	28	0	28	40	32	0
	1997	4	26	52	17	25	21	25	29	26	35	35	4
White	1996	6	32	37	24	9	38	23	29	9	30	44	17
	1997	13	30	41	16	11	24	24	41	9	28	40	22

Armed with this information, the Head was then able to challenge teachers' perceptions that *'they treat all the children the same, and can't understand why Black pupils do not achieve'*. The data at KS2 (Table 7), was particularly damning, because it rocked teachers' long-held assumptions that Black pupils were coming in at Year 7, at a lower level of ability than their white peers, and this insidious belief, '*coloured*' their expectations of Black pupils. With the support of our organisation, the Head devised specific and focused strategies, based on the concrete information from the data, to raise the achievements of Black pupils in Mathematics & Science, initially at KS3, and then at KS4 (GCSE). These included:

For Teachers:

- In-service training on raising the achievement of Black pupils in Mathematics and Science. These sessions addressed a range of issues, such as: access to the curriculum, and multicultural education, teaching styles and pedagogy, target setting, whole-school ethos, support for Black parents and pupils, and the management of change in multi-ethnic schools.
- A new discipline structure, making teachers accountable for their relationships with *all* pupils. In this system, teachers were monitored to determine patterns in their discipline problems with pupils. The Head monitored all discipline records, which became a part of each teacher's appraisal portfolio. Teachers' good intentions were no longer enough!
- One of the Deputy Heads was sent on a Careers Guidance training course, and appointed as the Careers Guidance Specialist for the school. New monitoring forms were designed to monitor by gender/ethnicity, the Careers advice given to all pupils.

For Black Pupils:

- Black Pupils were asked in a confidential questionnaire, to identify the teachers that they considered to be 'good' teachers, and to give examples of the qualities that these 'good' teachers exhibited towards them. This information was used in running an In-Service training session for teachers, on how to develop and sustain positive relationships with Black pupils. Older Black pupils were involved in the delivery of this session, and felt very much empowered by it.
- The involvement of Black professionals from non-stereotypical professions in Careers guidance was introduced, to raise the aspirations of Black pupils.

For Parents:

- The school provided a designated room for parents, which both Black and white parents were involved in designing and decorating. This encouraged more Black parents to feel welcome in school.
- Parents were now involved in discussions with teachers regarding the setting/streaming of their children. A formal setting/streaming regime was adopted, with specific guidelines for teachers and parents, and an appeals procedure involving the Head and school governors.
- Whenever Careers advice was given to a pupil, the parent had to be present, and was encouraged to bring a relative or someone else whose judgement they trusted, to the session. Many Black parents found this liberating, as some of them were not sufficiently well informed to offer appropriate guidance, in their children's career choices.
- Parents were invited to meetings, and sent all the data on ethnicity/gender, in all examination results, and setting/streaming. Parents agreed targets for improvement with the Head, and were involved in the monitoring of these targets.
- Parents were encouraged to discuss cultural identity issues with their children, and were offered additional support if they required it.

School X made an unequivocal commitment to ethnic/gender monitoring of all data. As the Head now jokingly puts it, *"if anything moves round here, we monitor it, and then set targets for improvement*!" This policy has been at the heart of making race equality in academic outcomes, really happen in the school.

The initial results, a year later (Table 10) speak for themselves. The number of Black pupils in the top levels at KS3, increased, in Science, Mathematics and English.

For example in Mathematics, at Level 6+ (the highest level), the percentage of Black pupils rose from 0% in 1996, to 29%, in 1997, while the proportion at the lower levels decreased. In Science, the improvement was more gradual, from 0% in 1996, to 4%, in 1997, with decreases in the lower levels. There is still some way to go, and the next target for improvement in 1998, is at the KS4 - GCSE exams, to improve the proportion of Black pupils attaining grades A-C in Mathematics and Science.

In School X, ethnic monitoring has been the key to turning around the academic fortunes of Black pupils. If only this strategy was undertaken in every school, and every LEA, as government educational policy, who knows how much more progress could be made, for Black pupils?

As School X has shown, without specific and focused strategies based on concrete information, little progress will be made in overcoming the educational disadvantage of Black pupils in Mathematics and Science.

The Road From Here: Beyond the rhetoric of 'race equality', towards innovation in curriculum and pedagogical reform

Whither Race and Education research in Britain?

In March 1996, at the annual Teacher Training Agency (TTA) Conference, Prof. Hargreaves, a leading academic in Britain, challenged the academic and research community, asking it to justify the benefits of educational research to schools, teachers, and pupils. This challenge understandably, caused quite a stir in academic circles. Following this Conference, the Times Educational Supplement (TES), commissioned a team of research experts, to undertake this challenge, in 10 key research areas. These included, gender, race, early years, post-16, teacher training, curriculum development, etc. The assessments of these academics[16], was that gender research had been the most effective, in terms of its impact on the achievement of girls, in Mathematics & Science, while race research had been the least impactful on schools, teachers and Black pupils.

These experts also noted two key facets of these research areas; gender research had been predominantly undertaken by female researchers, and had focused on subject disadvantage, and good practice strategies which were very much at the 'chalk face', and therefore highly accessible and transferable to teachers. Race research on the other hand, had been undertaken mainly by white male academics, and had focused on 'political' issues, which teachers had found inaccessible and untransferable, for classroom practice.

The above assessment by the TES, seems to me, a good place to start to answer the question, how can race and education research in Britain, through intellectual risk-taking, lead to innovation in curriculum and pedagogical reform, as we approach the millennium? Where de we go, after four decades of wasted opportunity, on deficit frameworks of under-achievement, and empty rhetoric on race equality? The comparative analysis of what has been achieved, by gender-based research, and more importantly, how it has been achieved, provide crucial lessons, and clues, for the way forward, on race and education research.

Natural loyalties:

Teaching is still by and large, a female-dominated profession, particularly, in primary schools. The natural loyalties, and empathy of the large numbers of female teachers in schools, has thus been available for gender researchers to tap into, enabling them to get their focused message across, much more easily. However, on race, not only has the message been lacking in clarity, but the profound under-representation of Blacks in the teaching force, has meant that there hasn't been the strong 'natural loyalty' base in schools, to take on board, the message of race equality. As with gender, we know that it is not simply about numbers, but also about positions of leadership. As more women teachers have moved into senior positions in schools, and in LEA's, at policy level, they have been able to take these 'natural loyalties' with them. There are few enough Blacks in teaching, and hardly any in senior positions, to have any such impact.

Leadership, Ownership & Empowerment:

The empowerment that women academics have achieved, from their leadership of gender research, has been a catalyst to their empowerment in other aspects. They have led the debate, dictated the agenda, and owned the issues. This has meant taking responsibility for their part, in the cycle of educational disadvantage, and has involved empowering girls and women, to raise their aspirations, and 'reach for the skies'. In comparison, Black academics, have not had the same leadership or ownership of race research in

Britain. If anything, its 'deficit theories', have enhanced their disempowerment. When race research in Britain, has been 'white male' dominated, how can it empower Blacks, and how can the agenda truly deliver race equality? After all, to quote an African proverb, *'until tales of hunting are told by Lions, they will continue to glorify the Hunter'*. Gender research has shown us that in challenging disadvantage, the *messenger*, is just as important as the *message*.

Political Will

There is no doubt that to effectively challenge any kind of disadvantage in society, there needs to be political will, at the heart of government, to facilitate positive change. The strongest indication of this political will, on gender-based disadvantage in education, has been the Legislation for the Statutory gender monitoring of all examination results and tests, in all schools and LEA's, in England and Wales. The fact that this legislation is still being withheld on Ethnic monitoring, is telling of the lack of political will in government, to improve the lot of Black pupils in schools. This lack of support is particularly galling, when the same government, using the data obtained from gender monitoring, is now making pronouncements, on the need to raise the achievements of boys, who are now seen as underachieving, relative to girls. This double standard in political will, reminds me of a colloquial expression, which my parents use to describe a particular facet of colonialism in Africa, *'what the white man doesn't measure, he doesn't value'*. How telling this expression is, of Britain today.

Good Practice and Commitment

The hands-on approach which characterised much of gender research, helped to make it more accessible and transferable to teachers. It is inconceivable to find a Mathematics or Science teacher in Britain, today, who does not have in his/her 'tool-kit', innovative curriculum-based resources, and pedagogy, to enhance gender equality in the classroom. These have not only been developed by gender researchers, but have been based on the good practice developed, and the lessons learnt, from the many girls-only Mathematics and Science clubs, organised and run, by these committed women pioneers, in the seventies and eighties. I do not wish to embarrass any of these women by naming them here, but we certainly owe them, a considerable debt of gratitude, for their hands-on commitment at the 'chalk-face'. Many Mathematics/Science teachers who were encouraged to participate in these clubs, found them to be an invaluable innovative environment, for the development of girl-friendly curriculum and pedagogy in Mathematics and Science.

In sharp contrast to this hands-on commitment, to innovative curriculum and pedagogy development, from gender research, race research and its arms-length deficit pathologies, has seemed misleading, disingenuous, and insidiously voyeuristic. There seems to be no clarity of focus. Researchers are in the main, outside the classroom, and outside the 'disadvantaged group' looking in, without any insights, with which to begin their search for answers. Is it any wonder, that we have learnt little of good practice, from these 'voyeurs' in four decades of race-based research? A male mathematics teacher, venting this frustration, said to me, *"with girls, I know what things I can do in the classroom, to help them achieve. From the in-service training sessions I've attended, I know of the specific strategies which will help them. With Black pupils, I don't even know where to start, to help them, I keep being told that it is about racism, and that I must not be racist towards them, but that is like the proverbial, 'how long is a piece of string?'. I want the same kind of specific advice as I have been given on girls, so that I can try it out in the classroom."*

Is it any wonder then, that among Blacks in Britain, there is now a weary cynicism, regarding race-based research. A Black parent, following a recent research report, about, yet again, the 'under-achievement' of

Black pupils, remarked, *"We Blacks must be the most over-researched group in this country! When are they going to stop doing research, and actually start to help our children, don't they know by now, what they need to do, to help our children to succeed in school ?"*

Brown (1993) made a similar plea, regarding some aspects of research on gender in education, in her article entitled *'Monitoring Bleakness or instigating Change?'* In this article she bemoaned, *'the emphasis of research on dismal descriptive studies, which simply reconfirmed the mapping of inequalities*, and exhorted researchers, *to put their energies into work, which both sets out to explain why things turn out as unequal as they do, and to undertake action research, which not only promotes that understanding further, but also sets change in motion,* through risk-taking and innovation.

The Economic Environment

The profound changes in the world of work, and the patterns of economic growth, have impacted on the enhanced achievement of girls and women. Certainly in Britain, where, over the past decade, employment growth has been particularly concentrated in the Service sector of the economy, employers have been keenly implementing the flexible working practices, that enhance productivity in this sector. Women have been able to benefit from these flexible working structures, more than men. It is after all, what they have been asking for, for so long, to enable them to combine the challenges of work, childcare commitments, and family life. These enhanced employment opportunities for women, have made it easier to 'sell' the benefits of enhanced educational achievements to girls, and thus raise their aspirations. After all, there is little point in exhorting girls to greater levels of achievement, if on gaining the relevant qualifications, they are unable to take up employment opportunities, because of the inherent inflexibility of the workplace.

Unity and Cohesion

It is inherent wisdom, that unity is strength. The unity of the gender campaign in bringing together women from across barriers such as social class, and race, has been part of the raison d'être of it's relative success. Unfortunately, on race, there is no such united front, and instead, the old games of colonialism are played out once more, 'divide and rule'. In multi-ethnic schools, teachers use the enhanced relative achievements of Asian pupils as a buffer zone, to shield their lower expectations of Black pupils, and then defend themselves with the disingenuous self-righteous indignation, articulated in statements such as, *"well, the Asian kids are doing well, so it must be the Black kids' fault, that they (the Black pupils) are not achieving, how can anyone accuse us of racism, when after all, the Asian pupils are not white either?"*

It is a sad and unfortunate observation, that if there had been Asian pupils in School X, it would have been well nigh impossible, to convince teachers, of the need to target innovative curricular and pedagogical strategies, at Black pupils. It is only when the situation is as starkly 'Black/white' as in School X, that teachers will ultimately shift ground.

This disunity, is inherent, even in the ethnic minority groups/communities themselves. In some LEA's, the strongest opponents of Ethnic monitoring have been Asian groups, who fear that the data will confirm the relatively enhanced achievements of their children, meaning that Local Authorities will then be able to justifiably, divert Section Eleven and GEST funds - These are special funds from central government, to support the language disadvantage of ethnic minority pupils, as such they have disproportionately benefited Asian pupils, to the chagrin of many in the African-Caribbean community- to support African-Caribbean pupils. Thus the 'divide and rule' politics of Section Eleven and GEST funding, has further excacebated the disunity on the 'race' front, among the ethnic minority groups themselves.

This disunity on the 'race' front, is of course, cynically exploited by the mainstream, and is another reason for the lack of innovation in curricular and pedagogical reform, on race and education, in Britain.

Conclusion

The challenges on the road to innovation in curriculum and pedagogical reform, on race and education, in Britain have been outlined above. How is the academic and research community, going to be able to tackle this challenge? It seems an awesome and insurmountable challenge, but what alternative is there, having 'wasted' four decades on 'voyeuristic' research on race and education, and empty rhetoric on race equality? The need for change is imperative, given the demographic time-bomb ticking away in the large metropolitan cities in Britain. We know from the 1991 Population Census data, that the biggest growth in the school-age population, over the next twenty years, will disproportionately come from ethnic minority communities, given their current younger age profile, in comparison to mainstream groups.

The African-Caribbean Network for Science & Technology, has committed itself and its membership, to this long, hard journey, because the prize that awaits us at the end, is worth the struggle. It is about the life chances, and futures of our children, in a 21st century, urban, technological society in Britain, and the opportunities for them, to take up their rightful place in this society, the country of their birth. We will work with all those, who share our genuine interest in advancing race equality, and are committed to transforming the educational disadvantage of African-Caribbean youth, in Mathematics and Science, through 'hands-on', innovative leadership for change.

Notes

1. Troyna and Farrow were writing in *Science in Primary Schools - the multicultural dimension* edited by Alan Peacock, published by Macmillam Education, 1991.

2. In this paper, Black is used as a political short-hand, to denote people of African, or African-Caribbean origin.

3. The National Curriculum has designated English, Mathematics and Science as Core subjects, meaning that they enjoy high status, and disproportionate allocations of school curriculum time. (70% in Primary schools, and 55-60% in Secondary schools).

4. Black Child Report, Amenta Marketing (Research Ltd.), 1997.

5. From Croydon Education Schools Advisory Service (SAS) Research Report (1997): *'In Search of Solutions to the Problem of Exclusions: Beginning with Perspectives of Black African-Caribbean Students.'* Research by Pam J. Smith, Adviser for Equal Opportunities.

6. The Times Newspaper, *'Children sent to Caribbean for 'basic' schooling'* (Damian Whitworth, 15th July 1996).

7. The Sunday Times Newspaper, *'Out of Africa: the schooling Blacks want'* (Donu Kogbara, 5th January 1997)

8. This trend was highlighted on the BBC2, Television Current affairs programme, *'Black Britain'*, on Tuesday 16th July 1996.

9. The 1997 Reith Lectures, *'The Genealogy of Race....Towards a Theory of Grace'*, by Prof. Patricia J. Williams. This quote is taken from the second lecture, *'The Pantomime of Race'*, Broadcast on BBC Radio 4, Tuesday 4th March 1997.

10. Runnymede Trust (1997) *'Islamophobia: A challenge for us all'*, London, Runnymede Trust.

11. These figures are for 1995, from Birmingham Careers Service. Similar data is available from other Careers Services.

12. Compiled by The African-Caribbean Network for Science & Technology, from UCAS admission data, supplied by the Higher Educational Statistics Agency (HESA).

13. The real name of the school has not been used, to preserve its anonymity, during this sensitive period of change.

14. The Independent Newspaper *'Closer inspection could narrow the ethnic gap'* (Michael Brooks, Education, Thursday 4th December 1997).

15. The African-Caribbean Network for Science & Technology, was the first to highlight with ethnicity-based data, from Leeds and Birmingham LEA's, the specific educational disadvantage of African-Caribbean pupils in Mathematics and Science. This was based on the initial quantitative aspect of our research. These results were highlighted in a number of mainstream press articles:

    The Times Educational Supplement (TES) - *'Caribbean Boys fall far behind'* (Nicholas Pyke, TES, 26th April 1996) and *'The Lost Generation'* (Reva Klein, TES 2, 26th April 1996). The Chairman of the CRE, was responding to these damning research findings in the TES, *'Ministers attacked over race research'* (Nicholas Pyke, TES, 3rd May 1996).

16. TES, 22nd March 1996

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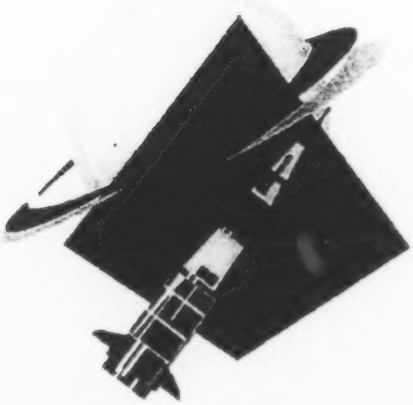
Elizabeth Rasekoala is Founder and General Secretary of the **African-Caribbean Network for Science & Technology**, whose **Mission Statement** is as follows:

"The African-Caribbean Network for Science & Technology is an educational charity set up in 1995, with the singular objective to advance the educational achievements and career aspirations of Black youth within the fields of Science, Mathematics & Technology, by engendering the ethos that the pursuit of such qualifications can be fun, empowering and achievable."

The Network runs careers guidance and mentoring programmes, involving Black professionals in the various fields of SET, as role models, to raise the aspirations of Black pupils. It also provides in-service training for teachers on multi-cultural Mathematics & Science, to widen access to the mainstream curriculum for Black pupils, and works to change teachers' stereotypical expectations of them. Alongside this, it has set up community-based, After-school tutorial support services (Ishango Science Clubs) in Manchester & Liverpool (developments in other cities are in the pipeline) to provide Black youngsters with enhanced curricular support in Maths, Science, Technology and other related subjects. The Network also provides an information support service for Black parents, to enable them to support their children's educational attainment more effectively.

Based in Manchester, The Network provides a nation-wide service through its national membership base, and is currently working with schools, Black pupils and parents in the following LEA's: Manchester, Trafford, Liverpool, Birmingham, Nottingham, Northampton, Leeds, Sheffield, Leicester, Reading, Bristol, and the London Boroughs of Enfield, Wandsworth, Brent, Southwark, Croydon and Waltham Forest. The Network is planning to expand its provision to Newcastle and other London Boroughs.



African-Caribbean Network for Science & Technology